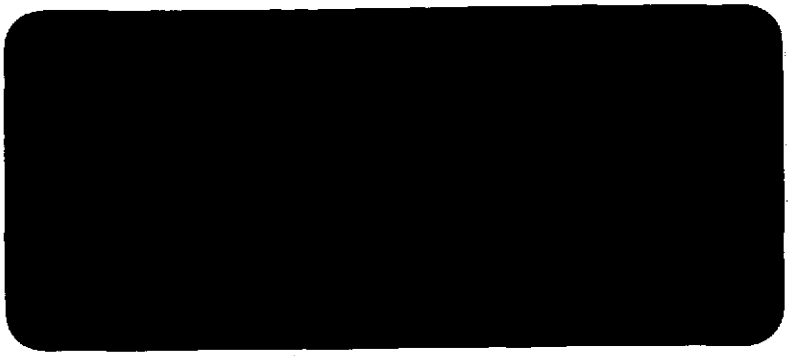



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SR No. 9629

# Retransmission of Hydrometric Data in Canada

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April 1975

Type I Report for the Period October 1974 - March 1975

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| Applied Hydrology Division,<br>Department of the Environment,<br>Ottawa, Ontario.<br>Canada K1A 0E7 | 11. GSFC Technical Monitor<br>Frederick Gordon |
| 12. Sponsoring Agency Name and Address | 13. Key Words(Selected by Principal Investigator) |
| As above | LANDSAT<br>DATA RETRANSMISSION |

14. Supplementary Notes

Report prepared by I.A. Reid and R.A. Halliday

15. Abstract

Nine Data Collection Platforms have been installed at Water Survey of Canada gauging stations for transmission of water resources data. Water level, water velocity, precipitation, air temperature, "ice-out" indicator, DCP battery check and water stage recorder clock operation have been transmitted from remote areas in Canada using the LANDSAT Data Collection System. The system has met requirements. An air depolarized carbon-zinc battery was tested with not entirely satisfactory results.

The suitability of satellite retransmission has been demonstrated. 19 Ball Brothers Research Corporation Convertible Data Collection Platforms Model CDCP-100 have been shipped for installation in various locations in Canada.

Type I Progress Report for Period

October 1, 1974 to March 31, 1974

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1. Accomplishments

The program continued with very few changes during the reporting period. Accomplishments during the period are as follows.

On March 12, 1975 the Manager, Earth Resources Survey Program, National Aeronautics and Space Administration (NASA) Washington, D.C. notified the Principal Investigator that NASA will continue to make the LANDSAT Data Collection System capability available for the retransmission of hydrometric data in Canada.

On March 25, 1975 Mr. E.F. Chapman checked and approved for delivery 19 Ball Brothers Research Corporation Convertible Data Collection Platforms Model CDCP-100. The locations of proposed and existing stations are shown in Figure 1. A list of these stations giving latitude and longitude faces Figure 1.

A start has been made on replacing the nine GE Timers on the Memomark II water level encoder with Chelsea Tuning Fork Timers Model TF-3. The Chelsea timers are considered to be more reliable particularly during extreme cold weather conditions.

On November 20, 1974, platform 6126 was removed from the Duncan River below B.B. Creek as land line telemetry was extented to this site by the British Columbia Hydro-Electric Power Authority. Pending relocation at another site prior to spring break-up, this platform has been temporarily installed for check purposes at Nelson, B.C. The installation includes a

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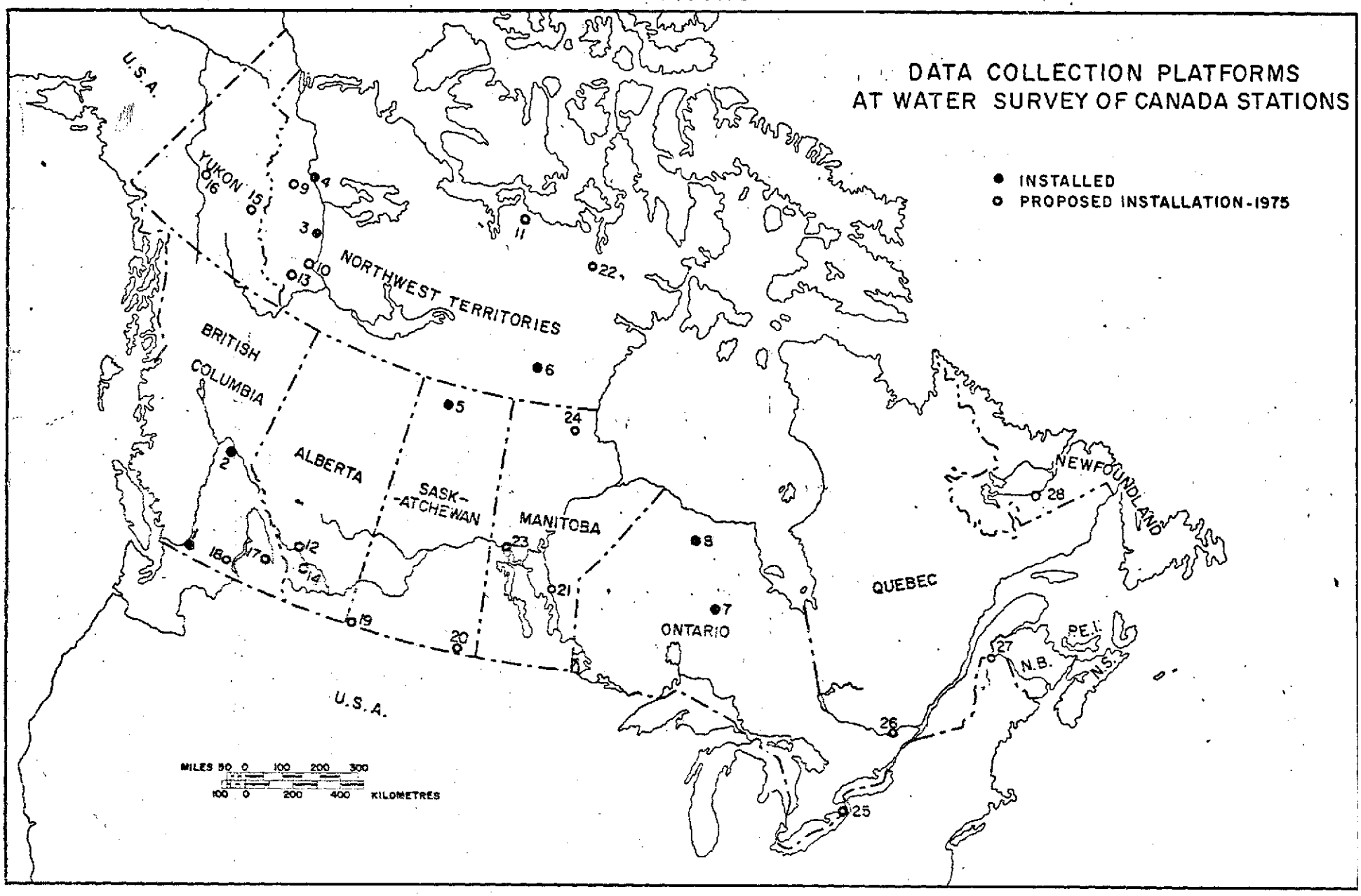
## LOCATION OF DATA COLLECTION PLATFORMS

| | | LAT. | | LONG. | |
|---|---|---|---|---|---|
| **INSTALLED** | | | | | |
| 1) | Nahatlatch River Below Tachewana Creek | 49° | 57' | 121° | 52' |
| 2) | McGregor River at Lower Canyon | 54° | 14' | 121° | 40' |
| 3) | Mackenzie River near Wrigley | 63° | 16' | 123° | 36' |
| 4) | Mackenzie River at Sans Sault Rapids | 65° | 46' | 128° | 45' |
| 5) | Lake Athabasca at Crackingstone Point | 59° | 23' | 108° | 53' |
| 6) | Kazan River at Outlet of Ennadai Lake | 61° | 15' | 100° | 58' |
| 7) | Albany River above Nottick Island | 51° | 38' | 86° | 24' |
| 8) | Winisk River at Kanachuan Rapids | 52° | 58' | 87° | 42' |
| **PROPOSED - 1975** | | | | | |
| 9) | Mountain River below Cambrian Creek | 65° | 14' | 128° | 34' |
| 10) | Root River near the Mouth | 62° | 29' | 123° | 26' |
| 11) | Ellice River near the Mouth | 67° | 42' | 104° | 08' |
| 12) | Red Deer River below Burnt Timber Creek | 51° | 39' | 115° | 01' |
| 13) | South Nahanni River near Hot Springs | 61° | 15' | 124° | 02' |
| 14) | Bow River below Carseland Dam | 50° | 50' | 113° | 25' |
| 15) | Pelly River at Pelly Crossing | 62° | 50' | 136° | 35' |
| 16) | South MacMillan River at Mile 249 Canal Road | 62° | 55' | 130° | 32' |
| 17) | Carney Creek below Pambrun Creek | 50° | 10' | 116° | 35' |
| 18) | Mission Creek near Kelowna | 49° | 54' | 119° | 08' |
| 19) | Battle Creek at International Boundary | 49° | 00' | 109° | 25' |
| 20) | Long Creek at Western Crossing of International Boundary | 49° | 01' | 103° | 04' |
| 21) | Lake Winnipeg at Berens River | 52° | 21' | 97° | 00' |
| 22) | Back River below Deep Rose Lake | 66° | 05' | 96° | 30' |
| 23) | Moose River near Moose Lake | 53° | 38' | 100° | 19' |
| 24) | Seal River below Great Island | 58° | 54' | 96° | 17' |
| 25) | Niagara River at Fort Erie Customs Dock | 42° | 56' | 78° | 55' |
| 26) | Rideau River at Ottawa | 45° | 23' | 75° | 42' |
| 27) | St. Francis River at Outlet of Glasier Lake | 47° | 12' | 68° | 57' |
| 28) | Churchill River at Muskrat Falls | 53° | 15' | 60° | 47' |

FIGURE I



Memomark II encoder with the Chelsea Tuning Fork

30 mm microstrip patch Ball Brothers antenna having a near hemispherical pattern. The antenna is fastened to a 3 mm thick aluminum support plate. Mounting provision is a standard 50 mm (2 in) pipe flange. After about a week's operation, the platform seems to be transmitting a normal number of messages although some of the readings appear invalid, possibly due to line noise in the telephone line from Washington to Ottawa.

Platform 6137, which was relocated in September, 1974 and equipped with a battery composed of Cipel & Le Carbone Type 321J air depolarized primary cells operated intermittently during the winter. Daily mean temperatures at Lansdowne House, 80 km from the DCP site, ranged from -30 to -10°C and it was found that usually the DCP did not transmit when daily mean temperatures less than -20°C occurred. It should be noted that the manufacturer warned that the cells would not be able to supply the 3.3A peak current draw at -40°C; the main reason for using these cells is to verify their 5 year lifetime and to determine their low temperature capability.

2. Major Problem

A problem still exists in receiving data by Telex from the Canadian Centre for Remote Sensing (CCRS), Ottawa at locations outside of Ottawa. The problem has not been isolated, but is thought to be in the Telex interface at CCRS. Personnel at CCRS are trying to remedy the situation.

3. Significant Results

None during this report period.

4. Significant Changes in Operating Procedures

On January 22, 1975, LANDSAT 2 was launched and now all DCS data are retransmitted by LANDSAT 2 rather than LANDSAT 1. The name of the project has been changed to the title used in the LANDSAT 2 proposal.

5. Published Articles or Papers

Sensor Data Retransmission by Satellite by R.A. Halliday presented at the Canadian Remote Sensing Society, Workshop on Remote Sensing of Snow Cover, January 13-15, 1975, Ottawa, Ontario.

6. Recommendations

On the basis of results to date, it is apparent that satellite retransmission is an excellent method of obtaining data from isolated areas. In many parts of Canada, it is the only way to obtain data on a real time basis. It is therefore recommended that data from remote areas be retransmitted via satellite when data is required from remote areas.

Future Plans

To install the 19 Ball Brothers Platforms as soon as possible upon their receipt which is expected during the second week of April. These Platforms will be used with LANDSAT and GOES Satellites.

CCRS have completed a study of receiving LANDSAT and GOES data at Prince Albert, Saskatchewan. They would be willing to supply the personnel to operate the system if the users paid the capital costs of $50,000 for LANDSAT plus an additional $25,000 for GOES. The decision on this is pending.